



**KALINGA
UNIVERSITY**

SCHEME & SYLLABUS FOR

**Bachelor of Vocational
Studies (B.Voc.)**

**Farm Equipment &
Machinery**



Kalinga University, Naya Raipur, Chhattisgarh

B.VOC IN FARM EQUIPMENT AND MACHINERY

Semester-01								
Course Code	Course Title	Credits	L	T	P	Internal Marks	End Semester Exam Marks	Total Marks
BVFEM101	Communication Skills	3	3	0	0	30	70	100
BVFEM102	Fundamentals of Information Technology	3	3	0	0	30	70	100
BVFEM103	Farm Power and Machinery	3	3	0	0	30	70	100
BVFEM104	Operation and Maintenance of Farm Machinery-I	3	3	0	0	30	70	100
BVFEM105P	On Job Training/Internship/Workshop	18	0	0	36	50	150	200
Total		30	12	0	36	170	430	600

Semester-02								
Course Code	Course Title	Credits	L	T	P	Internal Marks	End Semester Exam Marks	Total Marks
BVFEM201	Farm Engine and Tractor Systems	3	3	0	0	30	70	100
BVFEM202	Environmental Studies	3	3	0	0	30	70	100
BVFEM203	Operation and Maintenance of Farm Machinery-II	3	3	0	0	30	70	100
BVFEM204	Principle of Irrigation and Water Management	3	3	0	0	30	70	100
BVFEM205P	On Job Training/Internship/Workshop	18	0	0	36	50	150	200
Total		30	12	0	36	170	430	600

Semester-03								
Course Code	Course Title	Credits	L	T	P	Internal Marks	End Semester Exam Marks	Total Marks
BVFEM301	Operation and Maintenance of Micro Irrigation Systems	3	3	0	0	30	70	100
BVFEM302	Operation and Maintenance of Tillage Machineries	3	3	0	0	30	70	100
BVFEM303	Operation and Maintenance of Soil Forming and Land Shaping Equipment's	3	3	0	0	30	70	100
BVFEM304	Repair and Overhauling of Tractor Engine	3	3	0	0	30	70	100
BVFEM305P	On Job Training/Internship/Workshop	18	0	0	36	50	150	200
Total		30	12	0	36	170	430	600

Semester-04								
Course Code	Course Title	Credits	L	T	P	Internal Marks	End Semester Exam Marks	Total Marks
BVFEM401	Operation and Maintenance of Sowing and Weeding Equipment's	3	3	0	0	30	70	100
BVFEM402	Operation and Maintenance of Plant Protection Equipment's	3	3	0	0	30	70	100
BVFEM403	Repair and Overhauling of Tractor Transmission System and Controls	3	3	0	0	30	70	100
BVFEM404	Food processing	3	3	0	0	30	70	100
BVFEM405P	On Job Training/Internship/Workshop	18	0	0	36	50	150	200
Total		30	12	0	36	170	430	600

Semester-05								
Course Code	Course Title	Credits	L	T	P	Internal Marks	End Semester Exam Marks	Total Marks
BVFEM501	Occupational Safety and Health Education	3	3	0	0	30	70	100
BVFEM502	Operation and Maintenance of Power Tiller	3	3	0	0	30	70	100
BVFEM503	Servicing of Auto Electrical and Electronic System	3	3	0	0	30	70	100
BVFEM504	Maintenance and Servicing of Hydraulic System in Tractor	3	3	0	0	30	70	100
BVFEM505P	On Job Training/Internship/Workshop	18	0	0	36	50	150	200
Total		30	12	0	36	170	430	600

Semester-06								
Course Code	Course Title	Credits	L	T	P	Internal Marks	End Semester Exam Marks	Total Marks
BVFEM601	Agribusiness and Project Management	3	3	0	0	30	70	100
BVFEM602	Millet processing and Crop residue management equipment's	3	3	0	0	30	70	100
BVFEM603	Custom Hiring of Agriculture Machinery	3	3	0	0	30	70	100
BVFEM604	Operation and Maintenance of Crop Harvesters	3	3	0	0	30	70	100
BVFEM605P	On Job Training/Internship/Workshop	18	0	0	36	50	150	200
Total		30	12	0	36	170	430	600

SEMESTER-01

BVFEM101

COMMUNICATION SKILLS

Course Objective:

The purpose of this course is to introduce students to the theory, fundamentals and tools of communication and to develop in them vital communication skills which should be integral to personal, social and professional interactions. One of the critical links among human beings and an important thread that binds society together is the ability to share thoughts, emotions and ideas through various means of communication: both verbal and non-verbal. In the context of rapid globalization and increasing recognition of social and cultural pluralities, the significance of clear and effective communication has substantially enhanced.

Course outcomes:

- The purpose of this course is to introduce students to the theory, fundamentals and tools of communication
- To develop vital communication skills which should be integral to personal, social and professional interactions.
- One of the critical links between human beings.
- An important thread that binds society together is the ability to share thoughts, emotions and ideas through various means of communication: both verbal and non-verbal.
- In the context of rapid globalization and increasing recognition of social and cultural pluralities, the significance of clear and effective communication has substantially enhanced.

Unit - 1

06

Introduction: Theory of communication, types and modes of communication, mediums and channels of communication, barriers to communication, English as a global language, the lingua franca, social influences on English

Unit - 2

06

Language of Communication: Verbal and non-verbal (spoken and written) personal, social and business barriers and strategies intra-personal, inter-personal and group communication, varieties of English, language, accent, dialect, colloquialism, historical influences on English

Unit - 3

06

Speaking Skills: Monologue dialogue group discussion effective communication/ mis-communication interview public speech, regional influences on English, convergence and divergence, linguistic imperialism

Unit - 4

06

Reading and Understanding Close reading, reading analysis of a text - audience and purpose, content and theme, tone and mood, stylistic devices, structure comprehension- analysis and interpretation translation (from Indian language to English and vice-versa) literary/knowledge texts

Unit - 5

Writing Skills: Documenting report writing making notes letter writing, writing tabloids, diary entry, open letters, essays, newsletter and magazine articles, skits, short stories, impersonating characters it will enhance language of communication, various speaking skills such as personal communication, social interactions and communication in professional situations such as interviews, group discussions and office environments, important reading skills as well as writing skills such as report writing, note taking etc. while, to an extent, the art of communication is natural to all living beings, in today's world of complexities, it has also acquired some elements of science. it is hoped that after studying this course, students will find a difference in their personal and professional interactions.

References:

1. Fluency in English - Part II, Oxford University Press, 2006.
2. Business English, Pearson, 2008.
3. Language, Literature and Creativity, Orient Blackswan, 2013.
4. Language through Literature (forthcoming) ed. Dr. Gauri Mishra, Dr. Ranjana Kaul, Dr. Brati Biswas

BVFEM102

FUNDAMENTALS OF INFORMATION TECHNOLOGY

Course objective:

This is a basic course for commerce students to familiarize with computer and its applications in the relevant fields and exposes them to other related courses of IT.

Course Outcomes:

- Gain a foundational understanding of key IT concepts, including hardware, software, and networks.
- Develop proficiency in using common computer applications, such as word processing and spreadsheet software.
- Explore the ethical and security considerations in IT, emphasizing responsible digital behavior.
- Acquire problem-solving skills by applying IT knowledge to real world scenarios.
- Prepare for further studies in IT or related fields by establishing a strong IT knowledge base.

Unit - 1

06

- **Computer characteristics:** Speed, storage, accuracy, diligence; digital signals, binary system, ASCII; historic evolution of computers;
- **Classification of computers:** microcomputer, minicomputer, mainframes, supercomputers;
- **Personal computers:** desktop, laptops, palmtop, tablet; hardware & software; von Neumann model.

Unit - 2

06

- **Hardware:** CPU, memory, input devices, output devices.
- **Memory units:** RAM (SDRAM, DDR RAM, RDRAM etc. feature wise comparison only); ROM-different types: Flash memory;
- **Auxiliary storage:** Magnetic devices, optical devices; floppy, hard disk, memory stick, CD, DVD, CD/DVD-Writer;
- **Input devices** - keyboard, mouse, scanner, speech input devices, digital camera, touch screen voice input, joystick, optical readers, bar code reader;
- **Output devices:** Display device, size and resolution; CRT, LCD, LED;
- **Printers:** Dot-matrix, inkjet, laser; plotters, sound cards & speaker.

Unit - 3

06

- **Software:** System software, application software; concepts of files and folders, introduction to operating systems, different types of operating systems: single user, multitasking, time-sharing multi-user; booting, POST;
- **Basic features of two GUI operating systems:** Windows & Linux (Basic desk top management); Programming Languages, Compiler, Interpreter, Databases;
- **Application software:** Generic features of word processors, spread sheets and presentation software; generic introduction to latex for scientific typesetting; utilities and their use; computer viruses & protection, free software, open source.

Unit - 4

06

Computer Networks and Internet: Connecting computers, requirements for a network: server, workstation, switch, router, network operating systems; internet: brief history, world wide web, websites, URL, browsers, search engines, search tips; internet connections: isp, dial-up, cable modem, well, dsl, leased line wireless and Wi-Fi connectivity ; email, email software features (send receive, filter, attach, forward, copy, blind copy); characteristics of web-based systems, web pages, web programming languages.

Unit - 5

06

Information Technology and Society: Indian IT Act, intellectual property rights, issues. application of information technology in railways, airlines, banking, insurance, inventory control, financial systems, hotel management, education, video games, telephone exchanges, mobile phones, information kiosks, special effects in movies.

Programming Concepts & Techniques: Program concept, characteristics of programme, stages in program development, tips for program designing, programming aids, algorithms, pseudo code, notations, design, flowcharts, symbols, rules, compiler & interpreter. introduction to programming techniques, top-down & bottom-up approach, unstructured, & modular programming, cohesion, coupling, debugging, syntax & logical errors, linking and loading, testing and debugging, documentation.

References:

1. Programming in C, R.S. Salaria, Khanna Publishing House
2. Computer Concepts and Programming in C, R.S. Salaria, Khanna Publishing House
3. Handbook of Computer Fundamentals, N.S. Gill, Khanna Publishing House

BVFEM103

FARM POWER AND MACHINERY

Course Objective:

To equip the students with sufficient theoretical knowledge and practical skills about farm power and tractor power, implement resources used in agriculture, their cost of operation and selection.

Course Outcome:

Students equip with sufficient theoretical knowledge and practical skills about farm power and tractor power, implement resources used in agriculture, their cost of operation and selection.

Unit - 1

06

Farm Power and Tractors: Farm power in India - sources, IC engines – working principles, two stroke and four stroke engines, IC engine terminology, different systems of IC engine. Tractors – types and utilities.

Unit - 2

06

Tillage and Tillage Machinery: Tillage – ploughing methods – primary tillage implements – mould board, disc plough and chisel plough – secondary tillage implements – cultivators, harrows and rotovators – wetland equipment – puddlers, trammers and cage wheels.

Unit - 3

06

Sowing, Planting and Intercultural Equipment: Sowing methods – seed drills, seed cum fertilizer drills – Paddy transplanters – nursery requirements – implements for intercultural operations – wet land, dry land and garden land intercultural tools.

Unit - 4

06

Plant Protection Gadgets, Harvesting Machinery and Horticulture Tools: Plant protection equipment – harvesting tools and equipment's – reapers and combine – harvesting machinery for groundnut, tuber crops and sugarcane – tools for horticultural crops

Unit - 5

06

Equipment for Land Development and Farm Machinery Selection: Equipment for land development and soil conservation – Cost of operation of farm machinery – Tractor and implement selection

References:

1. Senthil kumar, T., R. Kavitha and V.M. Duraisamy 2015. A TEXT BOOK OF FARM MACHINERY, Thannambikkai Publications, Coimbatore. ISBN: 978-9381102305
2. Jagadishwar Sahay, 2010. ELEMENTS OF AGRICULTURAL ENGINEERING. Standard Publishers Distributors, New Delhi. ISBN: 978 – 818040440
3. Ojha, T.P and A.M. Michael 2005. PRINCIPLES OF AGRICULTURAL ENGINEERING VOL I. Jain Brothers, New Delhi. ISBN: 978-8186321638
4. Nakra C.P 1970. FARM MACHINERY AND EQUIPMENT: Dhanpat Rai Publishing Company Ltd, New Delhi ISBN: 978-8187433231
5. Sricastava, A.C., 1991. ELEMENTS OF FARM MACHINERY. Oxford & IBH Publishing Co Pvt Ltd, New Delhi. ISBN: 978-8120405134

BVFEM104

OPERATION AND MAINTENANCE OF FARM MACHINERY-I

Course Objective:

Students will be equipped with sufficient practical skills on farm power sources, handling of tractors, power tillers and various implements used in land preparation, sowing, inter cultivation and plant protection

Course Outcome:

Students can be equipped with sufficient practical skills on farm power sources, handling of tractors, power tillers and various implements used in land preparation, sowing, inter cultivation and plant protection

Unit - 1

06

Tractor and Power Tillers: Tractors – different types – makes – power tillers – working principle components – Uses – Major systems – Functioning of each system

Unit - 2

06

Tillage Implements: Tractor drawn implements – Primary Tillage – Secondary tillage implements – Proper hitching of Implements – Power tiller attachments – Operational Adjustments – Safety aspects

Unit - 3

06

Sowing Implements: Sowing implements – Types – Working Principle – Calibration of seed drill – Adjustments – safety aspects

Unit - 4

06

Special Planters: Paddy Trans planters – Pneumatic planters – Planters for Sugarcane and vegetables

Unit - 5

06

Plant Protection Equipment's: Plant protection Equipment's – types – Working principle of different types of sprayers

References:

1. Jain, S.C. and C.R. Rai, 1999. Farm tractors (Maintenance and Repair). Standard Publishers Distributors, New Delhi.
2. Barger, E.L., J.B. Liljedahl and E.C. McKibben, 1997. Tractors and their power units.
3. Wiley Easterb Pvt Ltd, New Delhi.
4. Jagadishwar Sahay, 1992. Elements of Agricultural Engineering. Agro book agency, Patna – 20.
5. Ralph Alcock, 1986, Tractor implement system. AVI Pub, co., Inc. West poert, connectient.
6. Sreevastave, A.C., 1990. Elements of Farm Machinery, Oxford and IBH Publication Co. New Delhi.
7. International journal of automotive technology, ISSN 1229-9138
8. Review of automotive engineering published by the Japanese society of automotive engineers.
9. www.idavette.net
10. www.autorepair.about.com



BVFEM105P

ON JOB TRAINING/INTERNSHIP/WORKSHOP

SEMESTER-02

BVFEM201

FARM ENGINE AND TRACTOR SYSTEMS

Course Objective:

To learn different systems of the tractor for effective functioning and maintenance.

Course Outcome:

Students know about different systems of the tractor for effective functioning and maintenance.

Unit - 1

06

Engine Components – working principle & construction of cylinder heads, types of combustion chambers. Function of Engine Valves. Description & function of connecting rod, importance of big-end split obliquely. Description of crankshaft & Camshafts. Firing order of the engine. Description and function of the fly wheel and vibration damper, Timing mark.

Unit - 2

06

Fuel system – different parts of the system – working of the system, care of fuel system; air cleaner – types, working principles – governing system – functions, principles of operation and methods of governing system.

Unit - 3

06

Cooling systems:- Purpose, types, Cooling system components, water pump, function of thermostat, pressure cap, Recovery system & Thermo-switch. Function & types of Radiator; Lubrication system: - purposes & characteristics of oil, type of lubricants, grade as per SAE, & their application, oil additives, type of lubrication system. Lubrication system components- different type of Oil pump, Oil filters & oil cooler. Probable reasons for low / high oil pressure, high oil consumption and their remedies.

Unit - 4

06

Ignition system – function, classification – CI system and SI system – different components of the system; Electrical system – different components of the system – battery, generator and starter motor; starting troubles and their remedies, battery maintenance

Unit - 5

06

Transmission system – clutch assembly – types; gears – functions; tractor differential, differential lock, final drive, torque converter – its functions and components; hydraulic system, components, controls and advantages; hitching of the implements – different types and its operation

References:

1. Sanjay Kumar, 2007, A TEXT BOOK OF TRACTOR AT A GLANCE, International book distributing company, Lucknow
2. Senthilkumar, T., R. Kavitha and V.M.Duraisamy 2015. A TEXT BOOK OF FARM MACHINERY, Thannambikkai Publications, Coimbatore. ISBN: 978-9381102305
3. Jagadishwar Sahay, 2010. ELEMENTS OF AGRICULTURAL ENGINEERING.
4. Standard Publishers Distributors, New Delhi. ISBN: 978 – 818040440
5. Ojha, T.P and A.M.Michael 2005. PRINCIPLES OF AGRICULTURAL ENGINEERING
6. VOL I. Jain Brothers, New Delhi. ISBN: 978-8186321638
7. Nakra C.P 1970. FARM MACHINERY AND EQUIPMENT: Dhanpat Rai Publishing Company Ltd, New Delhi ISBN : 978-8187433231
8. Sricastava, A.C., 1991. ELEMENTS OF FARM MACHINERY. Oxford & IBH Publishing Co Pvt Ltd, New Delhi. ISBN: 978-8120405134

BVFEM202

ENVIRONMENTAL STUDIES

Course Outcomes:

- Master core concepts and methods from ecological and physical sciences and their application in environmental problem solving.
- Apply systems concepts and methodologies to analyze and understand interactions between social and environmental processes.
- Master core concepts and methods from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.

Unit - 1

06

Introduction to Environmental Studies:

Multidisciplinary nature of environmental studies, Scope and importance; concept of sustainability and sustainable development.

Ecosystems:

- What is an ecosystem? Structure and function of the ecosystem;
- **Energy flow in an ecosystem:** food chains, food webs and ecological succession.
- **Case studies of the following ecosystems:** Forest ecosystem, grassland ecosystem, desert ecosystem, aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit - 2

06

Natural Resources:

- **Renewable and Non-renewable Resources:** Land resources and land use change; Land degradation, soil erosion and desertification.
- **Deforestation:** Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- **Water:** Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state).
- **Energy resources:** Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

Unit - 3

06

Biodiversity and Conservation:

- **Levels of biological diversity:** genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots, India as a mega-biodiversity nation; Endangered and endemic species of India
- **Threats to biodiversity:** Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions;
- **Conservation of biodiversity:** In-situ and Ex-situ conservation of biodiversity.
- **Ecosystem and biodiversity services:** Ecological, economic, social, ethical, aesthetic and Informational value.

Unit - 4

06

Environmental Pollution:

- Types, causes, effects and controls; Air, water, soil and noise pollution, Nuclear hazards and human health risks
- **Solid waste management:** Control measures of urban and industrial waste. Pollution case studies.

Environmental Policies & Practices:

- Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture
- **Environment Laws:** Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).
- Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

Unit - 5

06

Human Communities and the Environment:

- **Human population growth:** Impacts on environment, human health and welfare. Resettlement and rehabilitation of project affected persons; case studies.
- **Disaster management:** floods, earthquake, cyclones and landslides.
- **Environmental movements:** Chipko, Silent valley, Bishnois of Rajasthan.
- **Environmental ethics:** Role of Indian and other religions and cultures in environmental conservation.
- Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).

References:

1. Carson, R. 2002. *Silent Spring*. Houghton Mifflin Harcourt.
2. Gadgil, M., & Guha, R. 1993. *This Fissured Land: An Ecological History of India*. Univ. of California Press.
3. Gleeson, B. and Low, N. (eds.) 1999. *Global Ethics and Environment*, London, Routledge.
4. Gleick, P. H. 1993. *Water in Crisis*. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
5. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll. *Principles of Conservation Biology*. Sunderland: Sinauer Associates, 2006.
6. Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. *Science*, 339: 36--37.
7. McCully, P. 1996. *Rivers no more: the environmental effects of dams* (pp. 29--64). Zed Books.
8. McNeill, John R. 2000. *Something New Under the Sun: An Environmental History of the Twentieth Century*.
9. Odum, E.P., Odum, H.T. & Andrews, J. 1971. *Fundamentals of Ecology*. Philadelphia: Saunders.
10. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. *Environmental and Pollution Science*. Academic Press.

11. Rao, M.N. & Datta, A.K. 1987. Waste Water Treatment. Oxford and IBH Publishing Co. Pvt. Ltd.
12. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012. Environment. 8th edition. John Wiley & Sons.
13. Rosencranz, A., Divan, S., & Noble, M. L. 2001. Environmental law and policy in India. Tripathi 1992.
14. Sengupta, R. 2003. Ecology and economics: An approach to sustainable development. OUP.
15. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi.
16. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. Conservation Biology: Voices from the Tropics. John Wiley & Sons.
17. Thapar, V. 1998. Land of the Tiger: A Natural History of the Indian Subcontinent.
18. Warren, C. E. 1971. Biology and Water Pollution Control. WB Saunders.
19. Wilson, E.O. 2006. The Creation: An appeal to save life on earth. New York: Norton.
20. World Commission on Environment and Development. 1987. Our Common Future. Oxford University Press.

BVFEM203

OPERATION AND MAINTENANCE OF FARM MACHINERY-II

Course Objective:

To learn functions, components and working principle of intercultural operation machineries, rice transplanting and harvesting machinery, multicrop thresher.

Course Outcome:

Students able to learn functions, components and working principle of intercultural operation machineries, rice transplanting and harvesting machinery, multicrop thresher.

Unit - 1

06

Machinery for Intercultural operations - cultivators, sweep, junior hoe, manual weeders, power weeders for wetland and garden land - functions, components, working principle; estimating the cost of operation in the field condition.

Unit - 2

06

Rice Transplanting machinery - functions, components, working principle; estimating the cost of operation in the field condition.

Unit - 3

06

Harvesting machinery for paddy – self propelled vertical conveyor reaper and tractor rear/front mounted vertical conveyor reaper - functions, components, working principle; estimating the cost of operation in the field condition.

Unit - 4

06

Harvesting machinery for groundnut, tuber crops and sugarcane - functions, components, working principle; estimating the cost of operation in the field condition.

Unit - 5

06

Multi crop thresher – functions, components, working principle; estimating the cost of operation in the field condition.

References:

1. Ojha, T.P and A.M. Michael 2005. PRINCIPLES OF AGRICULTURAL ENGINEERING VOL I. Jain Brothers, New Delhi. ISBN: 978-8186321638
2. Nakra C.P 1970. FARM MACHINERY AND EQUIPMENT: Dhanpat Rai Publishing Company Ltd, New Delhi ISBN: 978-8187433231
3. Sricastava, A.C., 1991. ELEMENTS OF FARM MACHINERY. Oxford & IBH Publishing Co Pvt Ltd, New Delhi. ISBN: 978-8120405134

BVFEM204

PRINCIPLE OF IRRIGATION AND WATER MANAGEMENT

Course Objective:

To understand functioning of different irrigation practices, soil, plant and water relationship and methods adopted to improve irrigation efficiencies.

Course Outcome:

Students can understand functioning of different irrigation practices, soil, plant and water relationship and methods adopted to improve irrigation efficiencies.

Unit - 1

06

Sources of irrigation water, measurement of irrigation of water volumetric method, velocity area methods, direct discharge methods, weirs and orifices; water conveyance systems, open channel, underground pipe lines

Unit - 2

06

Irrigation methods, surface irrigation, and sub-surface irrigation, surface irrigation border, check basin, furrow, surge irrigation, conditional favorable to adapt the irrigation methods, its advantages and limitations

Unit - 3

06

Over Head irrigation methods or micro irrigation systems, Drip irrigation and sprinkler irrigation, description, components, advantages, limitations, suitability and hydraulics of flow for irrigation systems.

Unit - 4

06

Soil-water - plant relationship, Soil-water relationship, Soil-crop relationship, Crop-water relationship, factors affecting water requirements of crops, determination of water requirements of crop, soil-water-plant-relationship, Duty of water, relation between delta, duty and base period.

Unit - 5

06

Irrigation efficiencies Water conveyance, water distribution, water application, water storage, water use efficiency, methods used to improve irrigation efficiency, calculations of irrigation efficiencies

References:

1. Sharma, S.K. 1984. Principles and practices of irrigation Engg., S. Chand and Company Ltd., New Delhi.
2. Michael, A.M. and T.P. Ojha. 1987. Principles of Agricultural Engineering. Vol. 2. Jain Brothers, New Delhi.
3. Michael, A.M. 1983. Irrigation Theory & Practice, Vikas Publishing house, New Delhi.
4. Sivanappan, R.K. and Karaigowder. 1997. Irrigation and Drainage, Popular Book Depot, Chennai.
5. Basak, N.N. 1999. Irrigation Engineering. TATA McGraw Hill, New Delhi.

BVFEM205P

ON JOB TRAINING/INTERNSHIP/WORKSHOP

SEMESTER-03

BVFEM301

OPERATION AND MAINTENANCE OF MICRO IRRIGATION SYSTEMS

Course Objective:

To learn skills of designing, installation and maintenance of micro irrigation systems.

Course Outcome:

To learn skills of designing, installation and maintenance of micro irrigation systems.

Unit - 1

06

Importance of micro irrigation systems; relations between agronomy and micro irrigation, types of crops, types of soils, types of roots, identification of crop pattern, water requirement of different crops, and type of fertilizers.

Unit - 2

06

Design and layout plan of micro irrigation systems, survey of field, measurement of field, availability of water resources, shape and slope of field, designing fundamentals, spacing according to crops, and listing of crops to be produced.

Unit - 3

06

Components of micro irrigation system description and function of water pumps, control valves, filters, head-unit, laterals, emitters, back flow preventers, pressure regulator, flush valve, pipe/drip tape, connectors, micro sprinklers.

Unit - 4

06

Installation of micro irrigation system, installation of head unit, filters, valves, main and sub main line, trenching, adjusting length of drip line and testing of micro irrigation system.

Unit - 5

06

Maintenance of micro irrigation system cleaning of filters, pressure gauge readings, air valve and safety, valve cleaning, draining of drip lines, flushing of main line and sub main, changing emitters, removing and reinstallation of micro irrigation system and standard procedures of assembling and dismantling of micro irrigation system.

References:

1. Sharma, S.K. 1984. Principles and practices of irrigation Engg., S. Chand and Company Ltd., New Delhi.
2. Michael, A.M. and T.P. Ojha. 1987. Principles of Agricultural Engineering. Vol.2. Jain Brothers, New Delhi.
3. Michael, A.M. 1983. Irrigation Theory & Practice, Vikas Publishing house, New Delhi.
4. Sivanappan, R.K. and Karaigowder. 1997. Irrigation and Drainage, Popular Book Depot, Chennai.
5. Basak, N.N. 1999. Irrigation Engineering. TATA McGraw Hill, New Delhi.

BVFEM302

OPERATION AND MAINTENANCE OF TILLAGE MACHINERIES

Course Objective:

- To identify suitable farm implement based on soil and crop conditions.
- To learn field adjustments for achieving proper ploughing

Course Outcome:

- Student will be able to gain skill to identify suitable farm implement based on soil, moisture and crop conditions
- Student will acquire skill for adjusting the plough, harrows to reach the maximum output

Unit - 1 Mould board plough and Chisel plough UNIT- II: Disc plough and Reversible disc plough	08
Unit - 2 Rotavator	08
Unit - 3 Cultivator and Five Bottom plough	07
Unit - 4 Offset Disc Harrow	07

References:

1. Repair, Maintenance and Field Operation of Tillage Equipments, March 2011, Sector: Agriculture. For Modular Employable skills developed by National Instructional Media Institute, DGET, Ministry of Labour & Employment, Government of India, Chennai.
2. Ojha, T.P and A.M. Michael 2005. Principles of Agricultural Engineering VOL I. Jain Brothers, New Delhi. ISBN: 978-8186321638
3. Fundamentals of Agricultural Engineering, 2012, Er. Sanjay Kumar, Er. Vishal Kumar, Dr. Ram Kumar Sahu Published by Kalyani Publishers, Chennai, ISBN: 978-93-272-2168-8

BVFEM303

OPERATION AND MAINTENANCE OF SOIL FORMING AND LAND SHAPING EQUIPMENT'S

Course Objectives:

- To acquire skills in operation of soil forming and land shaping equipment's.
- To learn field adjustments and maintenance of equipment's

Course Outcome:

- Student will gain skill in operation of soil forming and land shaping machineries
- Student become expert in adjustments and maintenance of machine to reach highest efficiency

Unit - 1 Earth Moving Equipment's: Leveler, Laser Leveler, Terracer, Dumper, Wheel dozer and Chain dozer	06
Unit - 2 Ridger and Bund Former	06
Unit - 3 Bed former and Posthole digger	06
Unit - 4 Plastic mulching equipment	06
Unit - 5 Wet land equipment's- Peddler, Trampler and cage wheel	06

References:

1. Repair, Maintenance & Field Operation of Land Shaping and Development Machinery, March 2011, Sector: Agriculture for Modular Employable Skills, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
2. Repair, Maintenance & Field Operation of Soil Farming Equipment's, March 2011, Sector: Agriculture for Modular Employable Skills, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
3. Fundamentals of Agricultural Engineering, 2012, Er. Sanjay Kumar, Er. Vishal Kumar, Dr. Ram Kumar Sahu, Published by Kalyani Publishers, Chennai ISBN: 978-93-272- 2168-8
4. Ojha, T.P and A.M. Michael 2005. Principles of Agricultural Engineering VOL I. Jain Brothers, New Delhi. ISBN: 978-8186321638

BVFEM304

REPAIR & OVERHAULING OF TRACTOR ENGINE

Course Objective:

- To learn the importance of servicing of tractor engine.
- To acquire skills in engine overhauling.
- To identify faults in engine and its remedies

Course Outcome:

- Student will know importance of servicing of tractor and acquire skills in engine overhauling
- Student will be able to identify the faults in engine and its remedies

Unit - 1

Servicing of tractor

08

Unit - 2

Dismantling and assembling of engine components

08

Unit - 3

Radiator

07

Unit - 4

Air cleaner and fuel feed pump UNIT- V Fuel injection pump

07

References:

1. Mechanic Tractor, February 2016 Sector: Automobile, Common for Mechanic Tractor / Mechanic Agriculture Machinery, Trade: Practical, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
2. Repair & Maintenance of Radiator, March 2011, Sector: Agriculture for Modular Employable Skills, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
3. Repair & Overhauling of Tractor, October 2011, Sector: Agriculture for Modular Employable Skills, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
4. Basic Tractor Servicing, March 2011, Sector: Agriculture for Modular Employable Skills, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
5. Automobile engineering, 2006, Vol.2; Published by A.K. Jain, Standard Publishers Distributors, 1705-B, Nai Sarak, Delhi - 110 006, ISBN: 81-86308-01-6
6. A Text Book of Tractor at a glance (A unique book of farm power), 2007, Er. Sanjay Kumar, Published by International Book Distributing Co., Lucknow 226 001 UP, ISBN: 81-8185-185-6

BVFEM305P

ON JOB TRAINING/INTERNSHIP/WORKSHOP

SEMESTER-04

BVFEM401

OPERATION AND MAINTENANCE OF SOWING AND WEEDING EQUIPMENT'S

Course Objectives:

- To learn skills in handling of different types of seed planters and trans planters.
- To practice on field adjustments.
- To operate different types of weeders in field conditions

Course Outcome:

Student will acquire skill in handling of different types of seedling, planter, trans planter and practice on field adjustments and operates different types of weeders in field conditions

Unit - 1 Manually operated seed drill- Dibbler, Broad casting devices, Direct paddy seeder	06
Unit - 2 Power tiller drawn seed planter	06
Unit - 3 Tractor drawn seed planter, Broad bed furrow cum seeder, vegetable planter	06
Unit - 4 Trans planter- Manually operated rice trans planter and self propelled rice trans planter- Mat nursery, Pro-tray Seeder, Automatic Pro-tray seeder	06
Unit - 5 Manually operated- Dry land weeders, Cono weeder and Power weeder.	06

References:

1. Repair, Maintenance & Field Operation of Seed Drills, March 2011, Sector: Agriculture for Modular Employable Skills, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai
2. Repair, Maintenance & Field Operation of Planters and Transplanter, May 2011, Sector: Agriculture for Modular Employable Skills, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
3. Fundamentals of Agricultural Engineering, 2012, Er. Sanjay Kumar, Er. Vishal Kumar, Dr. Ram Kumar Sahu, Published by Kalyani Publishers, Chennai ISBN: 978-93-272-2168-8

BVFEM402

OPERATION AND MAINTENANCE OF PLANT PROTECTION EQUIPMENT'S

Course Objectives:

- To learn different types of sprayers and dusters and its application in field conditions.
- To identify the repairs and its remedies.
- To practice on field adjustments

Course Outcomes:

- Student acquire skill in operation and maintenance of different types of sprayers and dusters and its application in field conditions
- Student identify the repair and remedies of the sprayer and duster
- Student become expert in the operation and field adjustments of these machines

Unit - 1	06
Lever operated Knapsack sprayer, Foot sprayer, Foot rocker sprayer	
Unit - 2	06
Battery operated Knapsack sprayer, Hand sprayer, Hand held ULV sprayer	
Unit - 3	06
Power sprayer, Power duster, Hand rotary duster	
Unit - 4	06
High volume sprayer, Unimobile sprayer, Avenger ULV sprayer	
Unit - 5	06
Tractor operated Tall tree sprayer	

References:

1. Repair & Maintenance of Spraying and Dusting Equipments, March 2011, Sector: Agriculture for Modular Employable Skills, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai
2. Fundamentals of Agricultural Engineering, 2012, Er. Sanjay Kumar, Er. Vishal Kumar, Dr. Ram Kumar Sahu, Published by Kalyani Publishers, Chennai ISBN: 978-93-272- 2168-8
3. A Text Book of Farm Machinery, April 2015, Dr. T. Senthil kumar, Dr. R. Kavitha Dr. V. M. Duraisamy, Published by Thannambikkai publication, Coimbatore, ISBN: 978-93- 81102-30-5

BVFEM403

REPAIR AND OVERHAULING OF TRACTOR TRANSMISSION SYSTEM & CONTROLS

Course Objectives:

- To learn overhauling of tractor transmission systems.
- To identify the defects in transmission system and its remedies

Course Outcome:

Student become expert in overhauling in tractor transmission system and can identify the defects in the tractor transmission system and also rectify the same

Unit - 1 Clutch	06
Unit - 2 Gear box	06
Unit - 3 Differential	06
Unit - 4 Rear axle	06
Unit - 5 Steering box	06

References:

1. Basic of Transmission, Suspension, Steering System & Brakes, January 2014, Sector: Automobile for Centres of Excellence, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
2. Repair & Overhauling of Chassis System (Heavy Vehicle), March 2010, Sector: Automotive Repair for Modular Employable Skills, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
3. A Text Book of Farm Machinery, April 2015, Dr. T. Senthilkumar, Dr. R. Kavitha Dr. V.
4. M. Duraisamy, Published by Thannambikkai publication, Coimbatore, ISBN: 978-93- 81102-30-5
5. A Text Book of Tractor at a glance (A unique book of farm power), 2007, Er. Sanjay Kumar, Published by International Book Distributing Co., Lucknow 226 001 UP, ISBN: 81-8185-185-6

BVFEM404

FOOD PROCESSING

Course Objectives:

- To learn the operation of machineries used for making value added products.
- To understand the process, nutritive and market value of the value added products.

Course Outcomes:

- Students able to procure raw materials, operate the machineries for making value added products
- Assess nutritional value and scope of marketing

Unit - 1

06

Importance and scope of food processing- cereals, millets and pulses- introduction- processing methods- puffing- popping- flaking- malting

Unit - 2

06

Convenience foods- ready to use- extruder foods- bakery products- cakes- biscuits and bread

Unit - 3

06

Milk and milk product- processing of milk products- ice cream- panner- kulabjamun

Unit - 4

06

Principles and methods of fruit and vegetable preservation-fruit and vegetable products- jam, jelly, beverages, pickles- drying and dehydration-Ripening chamber and cold storage-packaging- principles in the development of protective packaging

Unit - 5

06

Food safety standards- introduction-Food Safety and Standards Act- eight laws, The Food and Drug Administration, Fruit Product Order, Bureau of Indian Standards, Prevention of Food Adulteration Act, Fair Average Quality, Hazard Analysis and Critical Control Point, ISO 22000, AGMARK, FSSAI-entrepreneurship-marketing- project preparation-cost economics.

References:

1. Fundamentals of Agricultural Engineering, 2012, Er. Sanjay Kumar, Er. Vishal Kumar, Dr. Ram Kumar Sahu, Published by Kalyani Publishers, Chennai ISBN: 978-93-272- 2168-8
2. Bakers Handbook on Practical Baking, 1994, US wheat Associate, New Delhi
3. Post-Harvest Technology of cereals and pulses, 1991, Chakravarthy, A and O.S. De, Oxford and IBH Publ. Co., New Delhi.
4. Presentation of Fruits and Vegetables, 1995 Giritharilal and G.S. Sighappa, published by publication and Information Division. ICAR New Delhi.
5. Food Processing, 1993, Pothy, V.H. and M.J. Mulky, Oxford and IBH Publ.Co., New Delhi.
6. Fruits and Vegetables preservation, 1998, Srivastava, R.P. and Sanjeev Kumar, International Book Distributing Co. Lucknow.
7. Outlines of Dairy Technology, 1980, Sukumar, De, Oxford University Press, Delhi.

BVFEM405P

ON JOB TRAINING/INTERNSHIP/WORKSHOP

SEMESTER-05

BVFEM501

OCCUPATIONAL SAFETY AND HEALTH EDUCATION

Course Objectives:

- To learn safety precautions in handling farm equipment's.
- To learn first aid methods and practice it on and off the field

Course Outcomes:

- Students able to follow the safety guidelines while handling farm equipment's.
- Students able to handle first- aid methods to safeguard the injured person.

Unit - 1

06

Safety & Health: Introduction to Safety Management, Safety Policy under Factories 1948 Act, Dangerous Machineries Act, Safety Committee, Safety Review, Responsibility of Management, Safety Officers Duties & Responsibilities, Safety Targets, Objectives, Standards, Practices and Performances. Motivation & Communication as part of Safety Program.

Unit - 2

06

Occupational Hazards: Basics Hazards, Chemical Hazards, Vibroacoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/Disorders & its prevention

Unit - 3

06

Accident & Safety: Need for Personal Protection Equipment, Selection, Use, Care & Maintenance of Respiratory and Non-respiratory Personal Protective Equipment, Non- respiratory Protective Devices of the operator, Accident Insurance Schemes

Unit - 4

06

First Aid: Burns, Fractures, Toxic Ingestion, Bleeding, Wounds and Bandaging, Artificial Respiration, Techniques of Resuscitation.

Unit - 5

06

Safety Health Practices: Health – Cleanness, Disposal of Waste, Ventilation and Temperatures, Dust & Fumes, Drinking Water, Lighting, Latrines & urinals. Safety - Fencing of machineries, Work on or near machinery in motion, Hoists and lifts, Pressure plants, Floors, Stairs and means of escape, Protection against fumes & gases, Safety offers. Welfare - Washing facilities in Dry clothing, Storing, Sitting, First Aid Appliances, Canteen, Shelters for rest & lunch, Crèches, Welfare offers, Right & Obligation of workers.

References:

1. Preventive and Social Medicine, Published by Benarus Publication, 23rd Edison, Author: Parle & Parle
2. First Aid, Published by Jaypee Publication – 2nd Edison, Author: Ahuja

BVFEM502

OPERATION & MAINTENANCE OF POWER TILLER

Course Objectives:

- To acquire skills in operation and maintenance of power tiller.
- To learn adjustments in engine and transmission system

Course Outcomes:

- Student become expert in the operation and maintenance of power tiller
- Student can be expert in the adjustments of the engine and transmission system of the power tiller

Unit - 1 **06**
Familiarizing the tools for maintaining the power tiller- Identifying the different system of power tiller

Unit - 2 **06**
Dismantling and assembling of the power tiller engine- Overhauling, dismantling and assembling of main clutch of power tiller- Overhauling of steering clutch and brake of the power tiller

Unit - 3 **06**
Adjustment of clutch assembly- Adjustment of transmission system

Unit - 4 **06**
Dismantling, checking, repairing and assembling of rotavator- Replacement of tynes of the tiller

Unit - 5 **06**
Periodical maintenance of the power tiller- Preventive maintenance of the power tiller- Important brake down maintenances- Field operations of the power tiller and its attachments

References:

1. Repair, Maintenance & Operation of Power Tiller, March 2011 Sector: Agriculture for Modular Employable Skills, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
2. Mechanic Tractor, February 2016 Sector: Automobile, Common for Mechanic Tractor / Mechanic Agriculture Machinery, Trade: Practical, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
3. Practical Agricultural Engineering, 1993, R K Ghosh & S Swain, Naya proksah publications, Kolkata, ISBN: 81-85421-15-3

BVFEM503

SERVICING OF AUTO ELECTRICAL & ELECTRONIC SYSTEM

Course Objectives:

- To learn electrical and electronic systems used in tractor.
- To service the electrical system in tractor

Course Outcome:

The students acquire skill to identify the repairs in electrical and electronics system used in the tractor and service the alternator and starting motor of the tractor.

Unit - 1

06

Locating electrical parts, system and controls of the tractor- Making different joints on simple strapped conductors- Sieving, insulating the conductors- Measuring the gauge of the conductors- Soldering the wire joints

Unit - 2

06

Making series and parallel connections and circuits- Connecting the voltmeter and ammeter- Checking the fuse box, wires short circuited and identification of starting system wiring and marking on terminal joints- Study of circuit breakers, relays and construction of simple circuit using relay

Unit - 3

06

Testing of alternator output voltage, circuit voltage drop and trouble shooting in charging system- Dismantling and assembling of alternator and trouble shooting of alternator

Unit - 4

06

Dismantling and assembling of starter motor- Replacement of brushes and commutator- Checking up of spark plug, head light, ignition coil and condenser

Unit - 5

06

Battery servicing- Study of rectifiers, diodes and charging systems- Study on sensors, electronic control assembly, engine scanners and different wiring systems

References:

1. Repair & Overhauling of Auto Electrical & Electronic System, March 2010, Sector: Automotive Repair for Modular Employable Skills, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
2. Mechanical Technology in Agriculture, 2005, Donald M. Johnson, Joe Harper, David E. Lawver, Philip, Buriak, Published by International Book Distributing Co., Lucknow 226 001 UP, ISBN: 81-8189-081-7
3. Mechanic Tractor, February 2016, Sector: Automobile, Common for Mechanic Tractor / Mechanic Agriculture Machinery, Trade Practical, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.

BVFEM504

MAINTENANCE & SERVICING OF HYDRAULIC SYSTEM IN TRACTOR

Course Objectives:

Familiarizing with field operation of hydraulic system. Identifying trouble shooting of hydraulic system and its solutions

Course Outcome:

Student become expert in the identification of repair and maintenance of the hydraulic system of the tractor

Unit - 1

06

Identify the tools needed for maintenance of hydraulic system; Constructional details of hydraulic system; Types of pumps and valves used in hydraulic system

Unit - 2

06

Dismantling and assembling of hydraulic system; Check, repair, replace and adjustments of hydraulic system

Unit - 3

06

Constructional details of draft control, positional control and mixed control; Practice on changing the drive mechanism of hydraulic system

Unit - 4

06

Describe the components of three point linkage; Practice on hitch agriculture equipment's with three point linkage; Identification of the faults and remedies of three point hitch system

Unit - 5

06

Practice on field operation, care and maintenance of hydraulic system; Trouble shooting of hydraulic system- Problem, causes and solution

References:

1. Repair & Overhauling of Hydraulic System, October 2011, Sector: Agriculture for Modular Employable Skills, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai
2. A Text Book of Tractor at a glance (A unique book of farm power), 2007, Er. Sanjay Kumar, Published by International Book Distributing Co., Lucknow 226 001 UP, ISBN: 81-8185-185-6
3. Mechanical Technology in Agriculture, 2005, Donald M. Johnson, Joe Harper, David E. Lawver, Philip, Buriak, Published by International Book Distributing Co., Lucknow 226 001 UP, ISBN: 81-8189-081-7



BVFEM505P

ON JOB TRAINING/INTERNSHIP/WORKSHOP

SEMESTER-06

BVFEM601

AGRIBUSINESS AND PROJECT MANAGEMENT

Course Objectives:

To identify Agriculture Business and to draw plans to reach the objectives and to manage the staff.

Course Outcome:

Student can identify Agriculture Business and to draw plans to reach the objectives and to manage the staff.

Unit - 1

06

Introduction to Management and evolution of management thoughts: Management - Definition - Importance of Management - Management Thought and Process - Significance of Management - Nature of Management functions - Management Roles - Functions at various levels of Management - Management skills in organizing business.

Unit - 2

06

Agribusiness Management : Agribusiness - Definition - Evolution of Agribusiness - Agribusiness status in developed and developing nations. Special features of Agribusiness - Scope for Agribusiness in India. Government Promotional Programmes in Agribusiness. Classification of Enterprises - Micro, Small, Medium and Large. Forms of Business Organization - Sole Proprietorship - Partnership - Private and Public Limited.

Unit - 3

06

Project Characteristics: Meaning and definition of project - Types and characteristics of project - Project Life Cycle - Phases in Project Management. Agencies involved in Developing Agri. Projects - NABARD, Cooperative Banks, DIC and Commercial banks, National Institutes and Project incubation Centers.

Unit - 4

06

Project Formulations: Project formulation - Methods - Feasibility analysis, Techno economic analysis - Project design and feasibility report for Agribusiness. Role of government and entrepreneur in project formulation.

Unit - 5

06

Project Appraisal: Objective of Appraisal; Appraisal of feasibility report and project report - appraisal of project funds and social cost benefits. SWOT analysis.

References:

1. Goel B.B., Project Management - A Development Perspective, Deep or Deep Publishers, New Delhi.
2. Gary R.Heerkens, Project Management, Tata McGraw Hill, New Delhi.
3. S.K. Kapur, Principles and Practice of Management, S.K. Publishers, New Delhi, 2004.
4. Heinz Wehrich and Harold Koontz., Management: A Global Perspective, McGraw Hill, New York, 2006.

BVFEM602

MILLET PROCESSING AND CROP RESIDUE MANAGEMENT EQUIPMENT'S

Course Objectives:

- To study the engineering properties of millets
- To learn the millet processing equipment operation and maintenance
- To study crop residue management equipment's

Course Outcomes:

- Students able to study the engineering properties of millets
- Students able to learn the millet processing equipment operation and maintenance
- Students able to study crop residue management equipment's

Unit - 1 Engineering properties of millets	06
Unit - 2 Drying, Dehusking of millets	06
Unit - 3 Rubber roller Sheller and polishers.	06
Unit - 4 Destoner, Grader and Pulveriser.	06
Unit - 5 Shredder, Baler and chaff cutter.	06

References:

1. Directory of Rural Technologies, Vol.1, Farm & Post-harvest Equipment, 1986, Published by Council for Advancement of Rural Technology, New Delhi
2. Principles of Agricultural Processing, 1994, P.H.Pandey, Published by Kalyani Publishers, New Delhi
3. Bankable Post Harvest Equipment developed in India, 1986, RP Kachru, PK Srivastava, BS Bisht & T P Ojha, Published by CIAE, ICAR-Bhopal

BVFEM603

CUSTOM HIRING OF AGRICULTURE MACHINERY

Course Objectives:

- To study different types of custom hiring.
- To learn the procedure for obtaining loan / subsidy.
- To learn bank account maintenance

Course Outcome:

Student will be able to study different types of custom hiring. To learn the procedure for obtaining loan / subsidy and to learn bank account maintenance

Unit - 1

06

Primary criteria of tractor selection size of land holding and type of operation, working time available, type of soil, type of implement, horse power requirements to operate the implement; Secondary criteria – running cost, after sales and repair facilities.

Unit - 2

06

Custom hiring – definition, types of custom hiring, advantages and disadvantages of custom hiring; Rental – definition, difference between rental and custom hiring, types of rental programme – pure and rollover; Leasing- definition, merits.

Unit - 3

06

Cash purchase and credit purchase – merits & demerits; Procedure for obtaining loan / subsidy – eligibility, quantum of loan, margin, cost of machinery repayment and interest; Norms for financing of tractors - acreage, insurance, selection of tractors and security.

Unit - 4

06

Log book and history sheet – important and use, maintenance; cost of utilizing the machine – Fixed cost – depreciation, interest, tax, housing and insurance, variable cost– cost of fuel, oil, repair and maintenance and driver wages;

Unit - 5

06

Survey on farmer's field – detail of field / crop available for engaging tractor on custom hiring basis; off season storage of tractor and agricultural machinery bank account maintenance.

Reference:

1. Custom Hiring of Agriculture Machinery, March 2011, Sector: Agriculture for Modular Employable Skills, Published by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labor and Employment, Government of India, Chennai.

BVFEM604

OPERATION AND MAINTENANCE OF CROP HARVESTERS

Course Objectives:

To learn the operation and maintenance of different root crop harvesting machineries

Course Outcome:

Student able to operate and maintain the different types of root crop harvesting machineries

Unit - 1 Potato Digger	06
Unit - 2 Groundnut Digger	06
Unit - 3 Turmeric Digger	06
Unit - 4 Sugarcane Harvester	06
Unit - 5 Maize Harvester	06

References:

1. Repair, Maintenance & Field Operation of Root Harvesting Equipments, March 2011, Sector: Agriculture for Modular Employable Skills, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
2. Farm Machinery and Equipment, Smith, Wilkes, Tata McGraw Hill.
3. Fundamentals of Agricultural Engineering, 2012, Er. Sanjay Kumar, Er. Vishal Kumar,
4. Dr. Ram Kumar Sahu Published by Kalyani Publishers, Chennai, ISBN: 978-93-272-2168-8
5. Performance Evaluation of Sugarcane Harvesters, 2002, Technical Report No. CIAE/AMD NATP/2002/272, CIAE, ICAR-Bhopal

BVFEM605P

ON JOB TRAINING/INTERNSHIP/WORKSHOP



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KALINGA UNIVERSITY

KALINGA UNIVERSITY, KOTNI , NEAR MANTRALAYA, NAYA RAIPUR - 492101, CHHATTISGARH

CALL: +91-9907252100